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Amendments To The Claims

JAN 04 2005

1. (canceled)
2. (canceled)
3. (canceled)
20. (canceled)
22. (presently amended) A computer-implemented method for shaping the output of cells on an output path of a multi-level data transmitting device, the multi-level data transmitting device being configured for regulating the cells from a plurality of input paths to the output path to a network, comprising:
sorting a plurality of queues in each level, each queue including a plurality of cells associated with a communication device, wherein the plurality of queues are arranged according to a weight and a data rate associated with each of the plurality of cells resulting in a plurality of sorted queues of queues, and wherein the sorting is performed based solely on inputs from the prior level;
regulating an aggregate output of cells from each sorted queue of queues based upon the data rates of the plurality of queues of the each sorted queue of queues; and
scheduling the regulated aggregate output of cells from each sorted queue of queues based upon a weight of the each sorted queue of queues, such that the scheduled output is coupled to the output path of each respective level to the next level;
wherein the scheduled output conforms to a plurality of characteristics of network connections, such that the network is efficiently used to carry the cells from the plurality of input paths to a plurality of communication devices.
23. (previously presented) A method as claimed in claim 22, wherein said plurality of input paths represent virtual connections.

24. (previously presented) A method as claimed in claim 22, wherein said plurality of input paths represent input ports.
25. (previously presented) A method as claimed in claim 22, wherein the data transmitting device is capable of outputting data encapsulated in at least one of cells and data packets.
26. (previously presented) A method as claimed in claim 22, wherein the data transmitting device is an ATM switch.
27. (presently amended) A computer-implemented method for shaping the output of cells on an output path of a multi-level data transmitting device, the multi-level data transmitting device being configured for regulating the cells from a plurality of input paths to the output path to a network, comprising:
sorting a plurality of queues in each level, each queue including a plurality of cells associated with a communication device, wherein the plurality of queues are arranged according to a weight and a data rate associated with each of the plurality of cells resulting in a plurality of sorted queues of queues, and wherein the sorting is performed based solely on inputs from the prior level;
regulating an aggregate output of cells from all sorted queue of queues based upon the data rates of the plurality of queues of the each sorted queue of queues; and
scheduling the regulated aggregate output of cells from each sorted queue of queues based upon a weight of the each sorted queue of queues, such that the scheduled output is coupled to the output path of each respective level to the next level;
wherein the scheduled output conforms to a plurality of characteristics of network connections, such that the network is efficiently used to carry the cells from the plurality of input paths to a plurality of communication devices, the plurality of input paths representing virtual connections.
28. (previously presented) A computer-implemented method for shaping the output of cells on an output path of a data transmitting device as recited in claim 27, wherein the data

transmitting device is capable of outputting data encapsulated in at least one of cells and data packets.

29. (previously presented) A computer-implemented method for shaping the output of cells on an output path of a data transmitting device as recited in claim 27, wherein the data transmitting device is an ATM switch.
30. (presently amended) A computer-implemented method for shaping the output of cells on an output path of a multi-level data transmitting device, the multi-level data transmitting device being configured for regulating the cells from a plurality of input paths to the output path to a network, comprising:
 - sorting a plurality of queues in each level, each queue including a plurality of cells associated with a communication device, wherein the plurality of queues are arranged according to a weight and a data rate associated with each of the plurality of cells resulting in a plurality of sorted queues of queues, and wherein the sorting is performed based solely on inputs from the prior level;
 - regulating an aggregate output of cells from all sorted queue of queues based upon the data rates of the plurality of queues of the each sorted queue of queues; and
 - scheduling the regulated aggregate output of cells from each sorted queue of queues based upon a weight of the each sorted queue of queues, such that the scheduled output is coupled to the output path of each respective level to the next level;
 - wherein the scheduled output conforms to a plurality of characteristics of network connections, such that the network is efficiently used to carry the cells from the plurality of input paths to a plurality of communication devices, the plurality of input paths representing virtual connections, and the data transmitting device is an ATM switch.
31. (presently amended) A computer-implemented method for scheduling the output of cells on an output path of a multi-level data switch, the multi-level data switch being configured for switching the cells from a plurality of input paths to the output path, comprising:

providing a plurality of queues in each level, each queue of said plurality of queues having a weight and an associated data rate, respective ones of said plurality of input paths being coupled to respective ones of said plurality of queues;

providing a plurality of queues of queues in each level, the plurality of queues being coupled to the plurality of queues of queues, such that the queues of the plurality of queues having a substantially equal weight being coupled to a same queue of queues of the plurality of queue of queues;

providing a plurality of traffic shapers, each of the plurality of queues of queues being input to an associated traffic shaper; and

providing a scheduler, the plurality of traffic shapers being input to the scheduler, the scheduler being coupled to said output path; and

wherein the data switch is an ATM switch.